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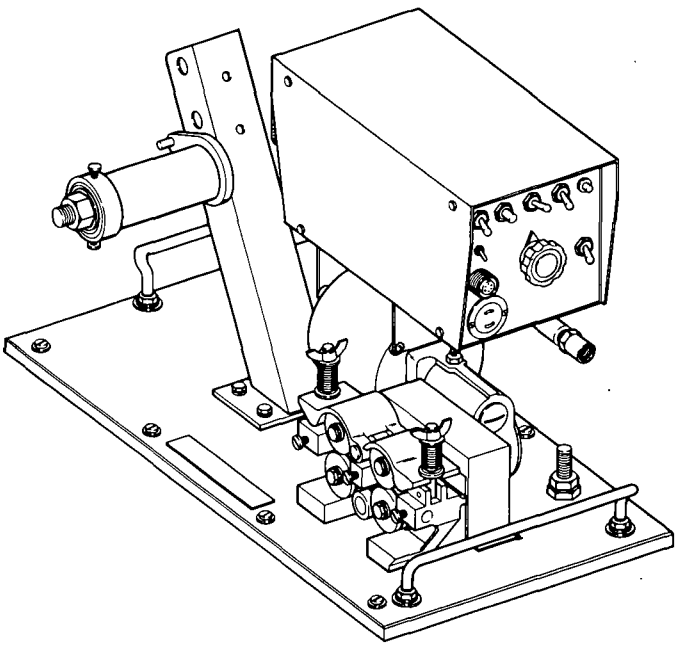
Effective With Serial No. HJ171707

MODEL
MILLERMATIC 30AN
CONTROL/FEEDER



OWNER'S MANUAL

MILLER ELECTRIC MFG. CO.
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APPLETON, WI 54912 USA

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SECTION 1 - INTRODUCTION

Electrode Wire Dia. Capability	Electrode Wire Feed Speed	Control Circuit Voltage At Gun	Overall Dimensions (Inches)	Weight (Pounds)	
				Net	Ship
.030" - 1/8"	20 to 900 ipm.	24 Volts	Height - 24-1/2 Width - 14-3/4 Depth - 34-1/4	66	71

Figure 1-1. Specifications

1 - 1. GENERAL

This manual has been prepared especially for use in familiarizing personnel with the design, installation, operation, maintenance, and troubleshooting of this equipment. All information presented herein should be given careful consideration to assure optimum performance of this equipment.

1 - 2. RECEIVING-HANDING

Prior to installing this equipment, clean all packing material from around the unit and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading and freight bill will be furnished by the carrier on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and/or Stock Number and Serial (or Style) Numbers of the equipment be supplied.

1 - 3. DESCRIPTION

This control/feeder is of the constant wire feed speed type and is designed to be used in conjunction with a constant potential welding power source.

The control/feeder is a heavy duty wire feeding unit combining both the wire feeder and the control in a compact assembly. It contains all the controls and equipment needed to supply welding wire and shielding gas to the welding gun.

1 - 4. SAFETY

Before the equipment is put into operation, the safety section at the front of the welding power source or welding generator manual should be read completely. This will help avoid possible injury due to misuse or improper welding applications.

The following definitions apply to CAUTION, IMPORTANT, and NOTE blocks found throughout this manual:

CAUTION

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may create a hazard to personnel.

IMPORTANT

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may result in damage to equipment.

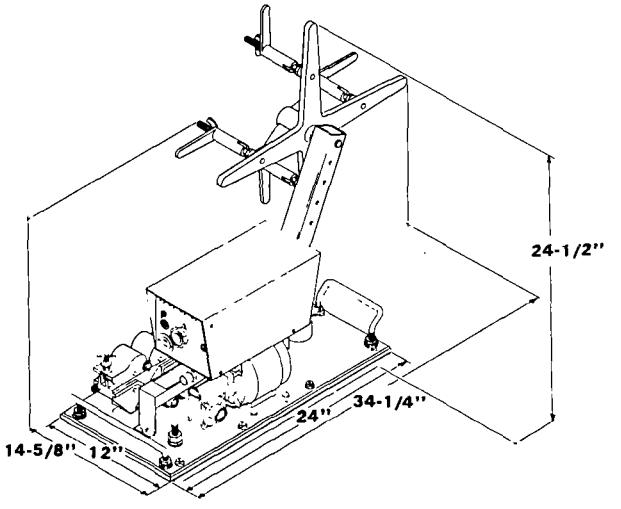
NOTE

Under this heading, explanatory statements will be found that need special emphasis to obtain the most efficient operation of the equipment.

SECTION 2 - INSTALLATION

2 - 1. LOCATION

Refer to Figure 2-1 for dimensional information on the control/feeder. Lead lengths must be considered when installing the control/feeder. If the welding power source can be located near the work area, the control/feeder can usually be installed on top of the welding power source. Suitable space should be allowed for making necessary connections.



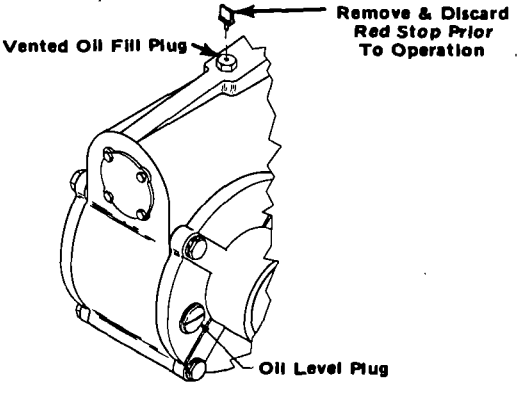
TC-056 132-2B

Figure 2-1. Control/Feeder Dimensions

2 - 2. DRIVE MOTOR (Figure 2-2)

The red stop, which is inserted into the hole in the vented oil fill plug, must be removed prior to operation of the control/feeder. See Figure 2-2 for the location of the red stop.

The oil level should be checked before the unit is put into operation and periodically thereafter. To check oil level in the gear housing, remove the oil level plug in the gear housing. Add SAE No. 90 oil, if necessary, until oil runs out the oil level hole.



AA-056 132-9A

Figure 2-2. Vented Oil Plug And Oil Level Plug

2 - 3. SHIELDING GAS CONNECTIONS (Figure 2-4)

Determine the distance the control/feeder is to be located from the shielding gas supply, and connect a hose from the regulator-flowmeter on the gas supply to the gas fitting on the rear of the control/feeder. This connection has a right-hand thread.

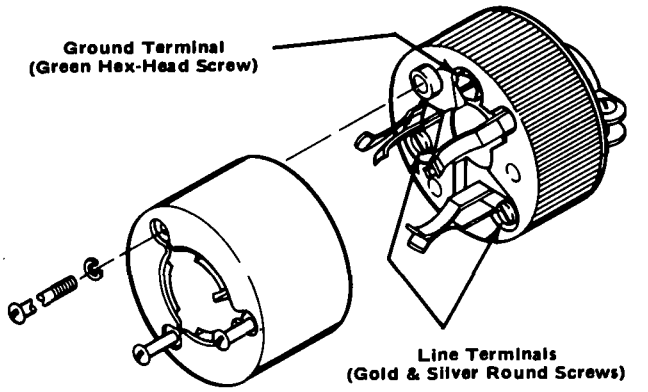
The shielding gas hose which comes from the gun is to be attached to the gas connector on the front panel of the control/feeder. This connector has a right-hand thread.

2 - 4. WATER CONNECTIONS (Optional) (Figure 3-1)

When a water-cooled gun is used, connect a hose from the water supply to the WATER IN fitting on the rear of the control/feeder. This fitting has a left-hand thread. See the gun Instruction Manual for gun to control/feeder connections. Route the return water where desired.

2 - 5. 115 VOLTS AC CONNECTIONS (Figures 2-3 & 2-4)

Since the control/feeder requires 115 volts ac to function, it is necessary to make up a power cable (16/3 is recommended) of the desired length with suitable plugs on each end (plug to control/feeder supplied; see Figure 2-3). After attaching the plugs, connect the power cable to the control/feeder (rear panel; insert, and rotate clockwise), and connect the remaining end to a 115 volts ac, 60 Hertz power supply.

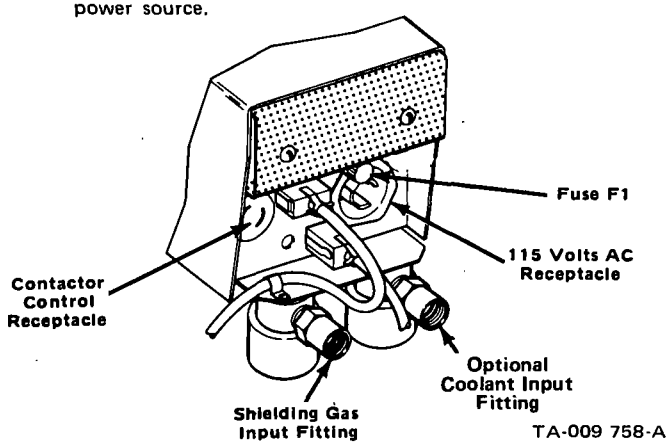


TA-056 179-10

Figure 2-3. 115 Volts AC Plug Installation

2 - 6. CONTACTOR CONTROL CONNECTIONS (Figure 2-4)

It is necessary to make up a contactor control cable (16/2 is recommended) of the desired length with suitable plugs on each end (plug to control/feeder supplied). After attaching the plugs, connect the cable to the control/feeder (rear panel; insert, and rotate clockwise), and connect the remaining end to the contactor control connection point on the welding power source.



TA-009 758-A

Figure 2-4. Rear Panel Connections

2 - 7. SWITCH CONTROL CONNECTIONS (Figure 3-1)

A two-pole, twistlock receptacle is provided on the front panel of the control/feeder for making switch control connections. When the switch connected across this receptacle is closed, the contactor in the welding power source will energize, shielding gas will flow, and wire will begin to feed.

2 - 8. WELD CABLE TERMINAL

A terminal is provided on the base of the control/feeder to serve as a junction point for joining together the weld cables from the welding power source and the gun.

IMPORTANT

Ensure that the weld cable terminal is kept clean at all times. Also ensure that the nut on this terminal is secure. If either one of the above conditions is not met, erratic weld current may result.

2 - 9. SPEED CHANGE GEARS

By varying the combinations of the supplied steel and nylon speed change gears, the minimum to maximum wire feed speed range of the control/feeder can be attained. The control/feeder is shipped with the 30 tooth nylon gear attached to the motor drive shaft and the 24 tooth steel gear attached to the drive assembly thereby supplying a wire feed speed range of from 50 to 500 ipm. Table 2-1 shows the various gear combinations available, and the wire feed speed ranges that these gear combinations will yield.

CAUTION

Do not use two steel gears together as this will cause weld current to be present on the motor and control assembly. Also, two nylon gears should not be used together as two nylon gears will wear rapidly.

Table 2-1. Gear Combinations For Various Wire Feed Speed Ranges

Motor Gear No. of Teeth	Drive Gear No. of Teeth	Min. Wire Speed Control Setting	Max. Wire Speed Control Setting
15 Steel	30 Nylon	20 ipm	225 ipm
15 Steel	24 Nylon	24 ipm	280 ipm
24 Steel	30 Nylon	35 ipm	370 ipm
24 Nylon	24 Steel	45 ipm	450 ipm
30 Nylon	24 Steel	50 ipm	550 ipm
24 Nylon	15 Steel	70 ipm	745 ipm
30 Nylon	15 Steel	90 ipm	900 ipm

To change the speed change gears, proceed as follows:

1. Remove the cover which is over the speed change gears.
2. Loosen the two bolts which secure the drive assembly to the base, and slide the drive assembly out (away from the motor).

IMPORTANT

The control/feeder uses a nylon and a steel gear in the drive train between the drive motor and the wire drive rolls. Proper clearance between the nylon and steel gear is important. The proper clearance is .007 inch. This is approximately the same thickness as two sheets of standard writing paper. The easiest way to obtain the proper alignment is to be sure that the motor is fastened securely to the base plate. Then insert a piece of .007 thick paper (or two thicknesses of standard writing paper) between the nylon and steel gear, check the alignment of the gears (the two gears must be running in a straight line), and then tighten down the drive roll assembly. If this proper clearance is not maintained in the gears, they may wear severely, bind, cause erratic wire feed, or break.

3. Using a 1/8 inch allen wrench, loosen the set screw in the gear on the drive assembly, and remove the gear.

4. Loosen the set screw in the gear on the motor drive shaft, and remove the gear.

5. Slide the desired gear onto the drive assembly, and tighten the set screw in the gear.

6. Slide the desired gear onto the motor drive shaft, and tighten the set screw in the gear.

7. Install the cover over the speed change gears.

2-10. WIRE GUIDE & DRIVE ROLL INSTALLATION (Figure 2-5)

Upon initial installation, or as a result of wire size changes, it is necessary to install the required drive rolls and wire guides to accommodate the particular wire size. Having selected the desired wire size and related parts, proceed as follows:

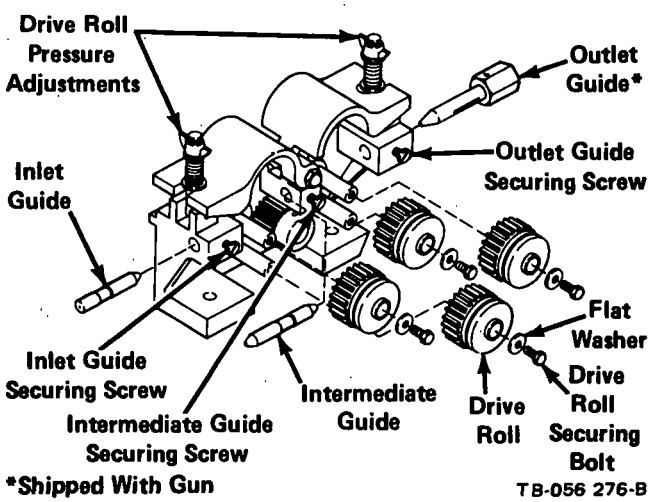


Figure 2-5. One-Piece Drive Roll Assembly

1. Loosen the pressure adjustment wing nuts, and pivot the pressure adjustments downward.

2. Remove the four drive roll securing bolts and associated washers from the drive shafts, and pull off the drive rolls.

3. Loosen the inlet, intermediate, and outlet guide securing screws, and remove the guides.

4. Install the desired size wire guides, and temporarily tighten securing screws.

NOTE

To prevent the three wire guides from slipping, ensure that the flat side of the wire guide is facing the securing screw.

5. Slide the desired size drive rolls (gear side first) onto the drive shafts.

6. Secure the drive rolls in place by installing the washers and bolts which were removed in Step 2.

7. Align all three wire guides so that the ends of the guides are 1/16 inch away from the drive rolls. Tighten securing screws.

8. Ensure that the teeth of the upper drive rolls mesh with the teeth of the lower drive rolls, and pivot the pressure adjustments upward until the washer on the pressure adjustments is seated on top of the drive roll cover. Tighten the pressure adjustment wing nuts just enough to hold the pressure adjustment assemblies in place.

2-11. SPINDLE ASSEMBLY INSTALLATION (Figure 2-6)

1. Insert spindle support shaft (15) into the desired hole in spindle support (16). The hole to be utilized in the spindle support (16) will depend on the size of the wire spool being used.

2. Secure spindle support shaft (15 with cotter pin (17).

3. Slide the following items onto the spindle support shaft (15) in order given:

   A. Fiber Washer (14)
   B. Flat Washer (13)
   C. Hub (12)
   D. Flat Washer (8)
   E. Fiber Washer (7)
   F. Keyed Washer (6)
   G. Spring (5)
   H. Flat Washer (4)

4. Rotate hex nut (3) onto support shaft (15). Hex nut (3) should be rotated only until a slight drag is felt while turning hub (12).

5. Proceed to install welding wire according to the applicable Section: 2-12 for spool-type wire; and 2-13, 2-14 for reel-type wire.

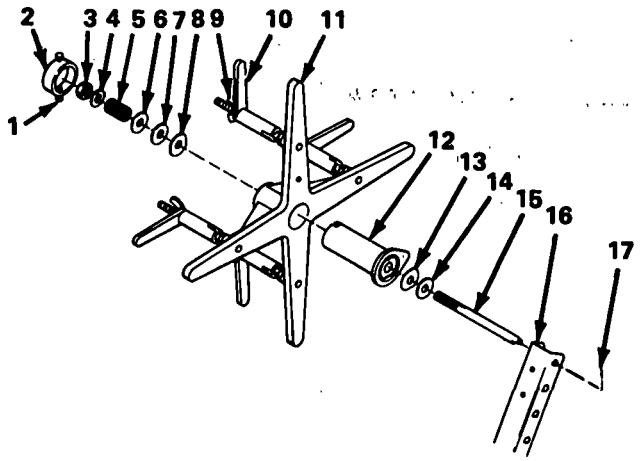


Figure 2-6. Hub And Reel Installation

2-12. INSTALLATION OF SPOOL-TYPE WIRE (Figure 2-6)

1. Slide the spool of wire onto the hub so that the wire feeds off the bottom of the spool. The spool turns in a counterclockwise direction.

2. Rotate the spool until the hole in the spool aligns with the pin in the hub. Slide the spool onto the hub until it seats against the back flange of the hub.

3. Depress the two spring-loaded stops (1) on the retaining ring (2) and slide the retaining ring into proper position on the hub (12). Release the two stops (1).

2-13. INSTALLATION OF WIRE REEL (Figure 2-6)

1. Slide the wire reel (11) onto the hub (12). Rotate the wire reel (11) until the hub guide pin is seated in the reel (11).

2. Depress the two spring-loaded stops (1) on the retaining ring (2) and slide the retaining ring (2) into proper position on the hub (12). Release the two stops (1).

2-14. INSTALLATION OF REEL-TYPE WIRE (Figure 2-6)

1. Loosen the four wing nuts (9) on the fingers (10) of the wire reel (11).

2. Pull the four fingers (10) out until they can be rotated toward the center of the reel (11).

3. Install the wire onto the reel (11) over the four fingers (10). Ensure that the wire feeds off the bottom of the reel (11). The reel (11) turns in a counterclockwise direction.

4. Rotate the four fingers (10) back to their proper position. Tighten the four wing nuts (9).

2-15. ADJUSTING HUB TENSION (Figure 2-6)

Check hub tension by slowly pulling wire toward the feed roll. The wire should unwind freely, but the hub tension should be sufficient to keep the wire taut and prevent backlash when the control/feeder is shut off. If adjustment is required, loosen or tighten the hex nut (3) on the end of the spindle support shaft (15) accordingly.

2-16. WELDING WIRE THREADING

1. Connect the gun to the control/feeder according to the instructions in the gun Instruction Manual.

2. Loosen the wing nut on each of the drive roll pressure adjustments, pivot adjustments downward, and lift the pressure gear covers upward.

3. Cut off any portion of the free end of the welding wire which is not straight. Feed the welding wire through the inlet wire guide in the drive roll assembly.

4. Continue to feed the welding wire through the intermediate and outlet wire guides.

5. Pivot the pressure gear covers downward making sure the teeth on the upper gears mesh with lower drive gears. The welding wire must also be in the grooves of the upper and lower drive rolls.

6. Pivot the drive roll pressure adjustments upward into the slot on the pressure gear covers making sure the lower flat washer is above the pressure gear cover.

7. Turn the wing nuts on the drive roll pressure covers in a clockwise direction until the drive rolls are tight against the welding wire. Do not overtighten. Further adjustment can be made after the welding power source and control/feeder are put into operation.

8. Energize the welding power source.

9. Place the control/feeder POWER switch in the ON position.

10. Depress the INCH switch. This will run the welding wire through the gun without placing weld current on the welding wire. Release the INCH switch after the end of the welding wire extends approximately one inch from the end of the gun tip.

SECTION 3 - FUNCTION OF CONTROLS

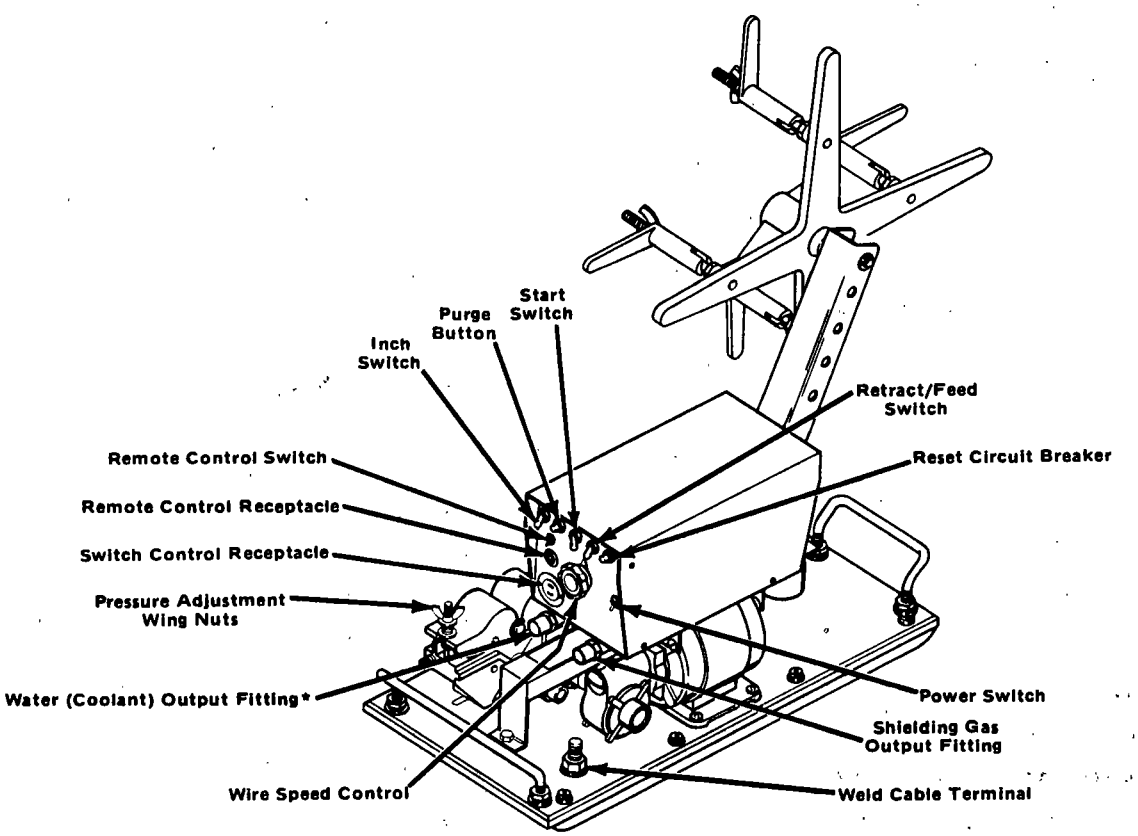


Figure 3-1. Control/Feeder Components

3 - 1. POWER SWITCH (Figure 3-1)

Placing the POWER switch on the control/feeder in the ON position will apply 115 volts ac to the unit and thereby place it in an operational condition. Placing the POWER switch in the OFF position will shut the control/feeder down.

CAUTION

Placing the POWER switch in the OFF position does not remove power from all of the control/feeder's internal circuitry. Completely terminate all electrical power to the control/feeder by removing the 115 volts ac plug from its power supply, and ensure that "machinery lockout procedures" have been employed on the welding power source's input line (see Instruction Manual on welding power source) before attempting any inspection or work inside the unit.

3 - 2. WIRE SPEED CONTROL (Figure 3-1)

The WIRE SPEED control provides a means of determining the rate at which welding wire will be fed into the weld. Rotating the WIRE SPEED control in a clockwise direction will increase the rate of the wire feed. When the WIRE SPEED control is set at 0, wire will feed at the slowest speed; when set at 100, the wire will feed at the fastest speed.

The scale which surrounds the WIRE SPEED control is calibrated in increments of ten ranging from 0 to 100 percent. Due to this percentage calibration, it should be noted that if this scale is being used to select a wire feed speed setting, only a percentage of the range in use is being selected and not an actual wire feed speed rate.

3 - 3. REMOTE CONTROL RECEPTACLE & SWITCH (Figure 3-1)

The wire speed may also be adjusted by a Remote Control (optional). Connect the Remote Control plug to the REMOTE CONTROL receptacle on the front panel of the control/feeder, and position the REMOTE CONTROL switch on the control/feeder and on the Remote Control unit to the REMOTE position. If it is desired to return the control of the wire speed to the control/feeder, place the REMOTE CONTROL switch on either the control/feeder or the Remote Control to the STANDARD position.

3 - 4. PURGE BUTTON (Figure 3-1)

The PURGE button, located on the front panel of the control/feeder, is a momentary contact switch. This switch will energize the gas solenoid and purge the shielding gas line of the gun. The PURGE button also allows the shielding gas regulator to be adjusted without energizing the welding circuit.

3 - 5. INCH SWITCH (Figure 3-1)

The INCH switch, located on the front panel of the control/feeder, is a spring-loaded toggle switch. When actuated it completes the circuit to the motor without having to depress the gun trigger switch. This switch will permit inching of the wire at whatever setting the WIRE SPEED control is at, without energizing the welding cirucit or the shielding gas valve.

3 - 6. START SWITCH (Figure 3-1)

The START switch provides the capability of being able to select either a slow wire feed speed for 1/2 second at the beginning of wire feed, or the wire feed speed at the rate set on the WIRE SPEED control. The SLOW position of the START switch will provide the 1/2 second of slow wire feed, and the FAST position will provide wire feed at the rate set on the WIRE SPEED control.

3 - 7. RETRACT-FEED SWITCH (Figure 3-1)

The RETRACT-FEED switch will determine whether the wire will feed out of the gun or back into the gun when the gun switch is closed. The RETRACT position will cause the wire to go back into the gun, and the FEED position will cause the wire to feed out of the gun.

3 - 8. RESET CIRCUIT BREAKER (Figure 3-1)

A circuit breaker, located on the upper portion of the control/feeder front panel, provides protection to the control/feeder motor. In the event the motor should be placed in an overload condition, the breaker would trip and suspend all output. Should this breaker trip, the RESET button would have to be manually depressed to reset the circuit breaker.

SECTION 4 - SEQUENCE OF OPERATION

4 - 1. GAS METAL-ARC WELDING (GMAW)

1. Make all connections as instructed in Section 2.
2. Place the RETRACT-FEED switch in the FEED position.
3. Place the START switch in the desired position.
4. Rotate the WIRE SPEED control to the desired setting.
5. If a Remote Wire Speed Control is not to be used, place the REMOTE CONTROL switch in the STANDARD position. If a Remote Wire Speed Control is to be used, place both the REMOTE CONTROL switch on the Remote Wire Speed Control and on the control/feeder in the REMOTE position.

CAUTION

Prior to welding, it is imperative that proper protective clothing (welding coat and gloves) and eye protection (glasses and/or welding helmet) be put on. Failure to comply may result in serious or permanent bodily damage.

6. Place the POWER switch on the control/feeder in the ON position.
7. Depress the PURGE button for one minute.
8. Energize the welding power source.
9. Hold the tip of the gun approximately 1/2 inch from the workpiece.
10. Depress the trigger on the gun handle. Gas and water will start to flow, and wire will start to feed if drive roll pressure is properly adjusted to prevent slippage. If wire slippage is noticed, tighten the drive roll pressure adjustment wing nuts 1/2 turn clockwise. Repeat until slippage stops. Do not tighten wing nuts too much.

CAUTION

The welding wire and all metal parts in contact with it are energized while welding. Do not touch the welding wire or any metal part making contact with it.

4 - 2. SHUTTING DOWN

1. Turn off the shielding gas and water at the source.
2. Place the POWER switch on the control/feeder in the OFF position, and remove the 115 Volts AC plug from the source.
3. Turn off all associated equipment.

CAUTION

If welding is performed in a confined area, failure to turn off the shielding gas supply could result in a buildup of gas fumes, thereby endangering personnel reentering the welding area.

SECTION 5 - MAINTENANCE

5 - 1. INSPECTION AND UPKEEP

Usage and shop conditions will determine the frequency and type of maintenance. Inspect equipment as follows:

1. Make sure welding power source is shutdown.
2. Inspect gun for broken areas, cracks and loose parts: tighten, repair, and replace as required.
3. Carefully remove any weld spatter or foreign matter which may accumulate around the nozzle orifice. Use a hardwood stick, never a metal tool.
4. Repair or replace, as required, all hose and cable; give particular attention to frayed and cracked insulation and areas where it enters equipment.
5. Remove grease and grime from components; moisture from electrical parts and cable.
6. Blow out the gun wire guide liner with compressed air when changing wire. This will remove any metal chips and dirt that may have accumulated.

5 - 2. CLEANING OF DRIVE ROLL BEARINGS

Occassionally it will become necessary to clean and oil the oilite bearings which are pressed into the four drive rolls. This cleaning operation should be performed whenever the oilite bearings appear dirty and grimy.

To clean and oil these bearings it will be necessary to first remove the four drive roll gears. (See Section 2-10 for removal and installation instructions.) Once removed, use a clean rag to wipe the bearings clean. Apply a light coat of oil to the bearings, and install the bearings back onto the drive roll shafts.

5 - 3. FUSE (Figure 2-4)

The control/feeder is protected from damage due to an internal short or excessive overload by a fuse. Fuse F1 is located on the rear panel of the control. If F1 should open, the control/feeder would be completely inoperative.

SECTION 6 - TROUBLESHOOTING

CAUTION

Hazardous voltages are present on the internal circuitry of the control/feeder as long as power is connected to the unit. Disconnect power before attempting any inspection or work on the inside of the unit. Troubleshooting of internal circuitry should be performed by qualified personnel only.

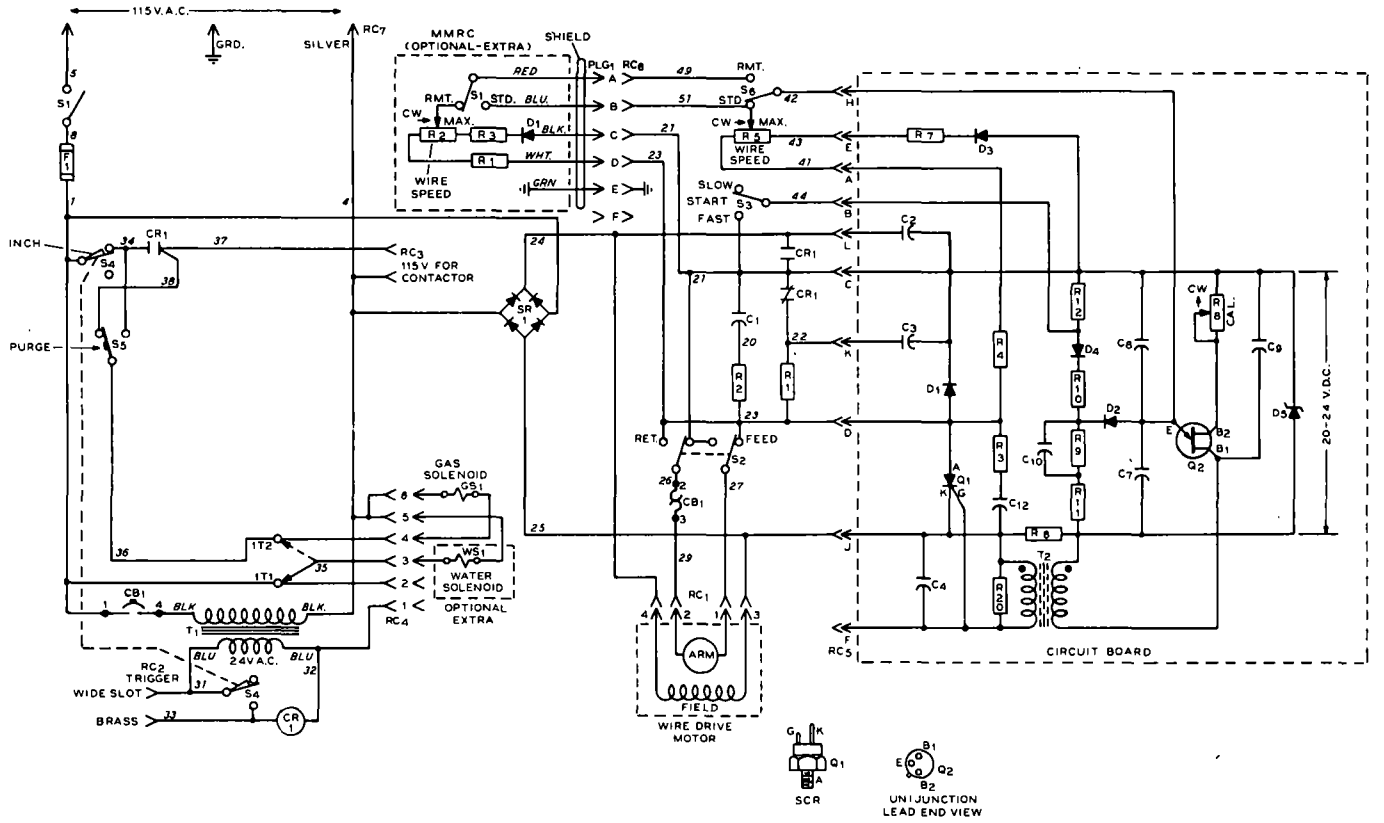
The following chart is designed to diagnose and provide remedies for some of the troubles that may develop in this control/feeder.

It is assumed that proper installation has been made, according to Section 2 of this manual, and that the control/feeder has been functioning properly until this trouble developed.

Use this chart in conjunction with the circuit diagram while performing troubleshooting procedures. If the trouble is not remedied after performing these procedures, the nearest Factory Authorized Service Station should be contacted. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly followed..

TROUBLE	PROBABLE CAUSE	REMEDY
Depressing gun switch will not energize control/feeder. Electrode wire is not energized and shielding gas does not flow.	POWER switch in wrong position or defective.	Place switch to ON position.
	Circuit breaker (CB1) tripped.	Replace defective POWER switch.
		Manually reset circuit breaker by depressing the button on the front panel of the control/feeder labeled RESET.
	Plug from gun switch is not secure in Switch Control receptacle (RC2) on control/feeder.	Insert plug fully into Switch Control receptacle (RC2) and rotate plug 1/2 turn clockwise.
	115 volts ac input plug is not secure in receptacle (RC7) and/or input line.	Insert plug fully into 115 vac receptacle (RC7) and rotate plug 1/2 turn clockwise, check plug at input line.
	115 volts input fuse (F1) open.	*Replace fuse (F1).
	Lead(s) 31 or 33 on the rear of the Switch Control receptacle is loose.	Remove control/feeder cover and check lead 31 & 33 connections on the rear of the receptacle.
	Coil of plug-in relay (CR1) defective.	Replace relay (CR1).
Wire feeds, shielding gas flows, but electrode wire is not energized.	115 vac Contactor Control plug is not secure in contactor receptacle on welding power source and/or control/feeder.	Insert plug fully into receptacle and rotate plug 1/2 turn clockwise (check both ends).
	Contactor Control cable leads not secure on contactor plug terminals.	Secure leads to plug terminals.
	Defect in welding power source.	See troubleshooting section in welding power source instruction manual.
Wire feeds erratically.	Pressure on drive rolls is insufficient.	Rotate pressure adjustment wing nuts clockwise in 1/4 turn increments until wire slippage stops.
	Drive roll is too large for wire size being used.	Change to proper size drive roll. See Section 2-10.
	Worn drive roll.	Replace drive roll. See Section 2-10.
	Dirt in drive roll.	Clean drive roll as instructed in Section 5-2.

*If it becomes necessary to replace any fuse in the control/feeder, ensure that a fuse of the proper size is used.



Circuit Diagram No. CB-056 132-1F

Figure 6-1. Circuit Diagram

SECTION 6 - DATA CHARTS

7 - 1. GENERAL

The two basic types of metal transfer are spray and short circuit. Spray transfer comprises a steady stream of fine droplets moving across a physical space from the electrode to the workpiece. The short circuit welding technique transfers metal from the electrode to the workpiece on contact only. The electrode physically touches the work and, since it is electrically energized, short circuits the welding circuit. The short circuiting action occurs many times per second.

7 - 2. POWER SOURCE REQUIREMENTS

Power sources required with the spray transfer technique of Gas Metal-Arc Welding are of the constant potential type. The constant potential power source may or may not have some method of slope control.

The short circuit method of metal transfer requires a constant potential class power source with some method of slope control. Slope settings may be fixed or adjustable by tapping a reactor either mechanically or electrically.

7 - 3. MILD STEEL AND LOW ALLOY STEEL

The settings provided in Table 7-1 are applicable to most weldable steels. Some modifications will be made for any specific application, of course, because the ranges are necessarily broad. They will constitute a basis for setting a welding condition.

Table 7-1. Short Circuit Transfer - Mild And Low Alloy Steels

Electrode Diameter	Amperage Range dcrp	Load Voltage	Slope Turns	Power Source
0.030"	70-130	15-21	6	250 Amp CP Welding Machine
0.035"	80-190	16-22	6	250 Amp CP Welding Machine
0.045"	100-225	17-22	6	250 Amp CP Welding Machine

Approximate Power Source Settings

The settings shown in Table 7-1 are predicated on using CO_2 shielding gas for mild steel and Argon-CO_2 for low alloy steel.

Table 7-2. Spray Transfer - Mild And Low Alloy Steels

Electrode Diameter	Amperage Range dcrp	Load Voltage	Slope Turns	Power Source
0.030"	150-265	24-28	0-3	CP Type
0.035"	175-290	24-28	0-3	CP Type
0.045"	200-315	24-30	0-3	CP Type
1/16"	275-500	24-32	1-4	CP Type
3/32"	350-600	24-33	1-4	CP Type

Approximate Power Source Settings

The settings in Table 7-2 are predicated on the use of Argon-5 pct. oxygen shielding gas for Mild and Low Alloy Steels.

Table 7-3. Short Circuit Transfer - Stainless Steel 300 Series

Electrode Diameter	Amperage Range dcrp	Load Voltage	Slope Turns	Power Source
0.030"	50-145	17-22	8-12	CP Type w/slope
0.035"	65-175	17-22	8-10	CP Type w/slope
0.045"	100-210	17-22	8-10	CP Type w/slope

Approximate Power Source Settings

The settings shown in Table 7-3 are predicated on the use of a trigas mixture of 90 pct. HE; 7-1/2 pct. A; 2-1/2 pct. CO_2 for Stainless Steel 300 Series. Flow rates were approximately 20 cfh.

Table 7-4. Spray Transfer - Stainless Steel 300 Series

Electrode Diameter	Amperage Range	Load Voltage	Slope Turns	Power Source
0.030"	160-210	24-28	2-6	CP Type
0.035"	180-255	24-29	2-6	CP Type
0.045"	200-300	24-30	2-6	CP Type
1/16"	215-325	24-32	0-4	CP Type
3/32"	225-375	24-32	0-4	CP Type

Approximate Power Source Settings

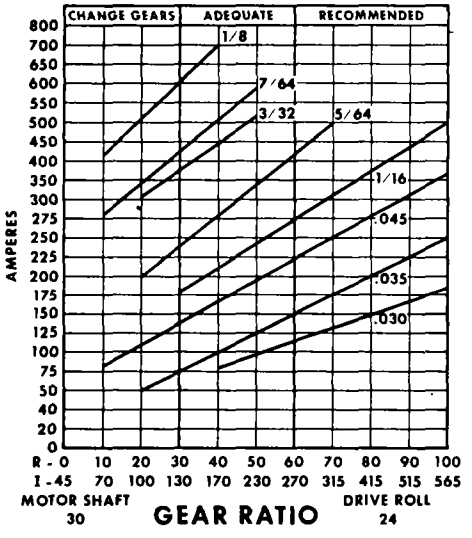
The settings shown in Table 7-4 are predicated on the use of Argon-Oxygen shielding gases for Stainless Steel 300 Series. Oxygen percentage varies from 1-5 pct.

Table 7-5. Flux Cored Settings

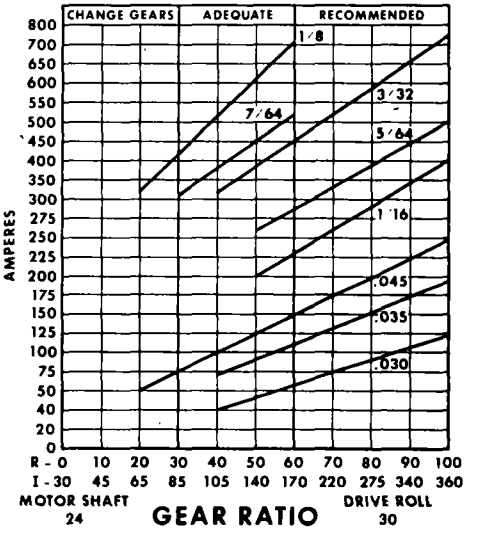
Wire Size	Arc Amps	Arc Volts	Gas Type	Gas Flow
1/16"	290-325	28-31	CO_2	40-48 CFH
5/64"	350-400	29-32	CO_2	40-48 CFH
3/32"	400-450	29-32	CO_2	40-48 CFH
7/64"	425-475	29-32	CO_2	40-48 CFH
1/8"	475-550	29-32	CO_2	40-48 CFH

Table 7-6. Amperage Output For Various Speed Change Gear Combinations Figures Based On Use Of CO_2 Shielding Gas

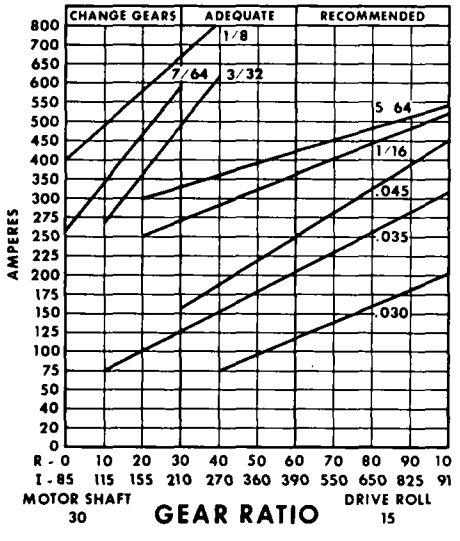
Graph A



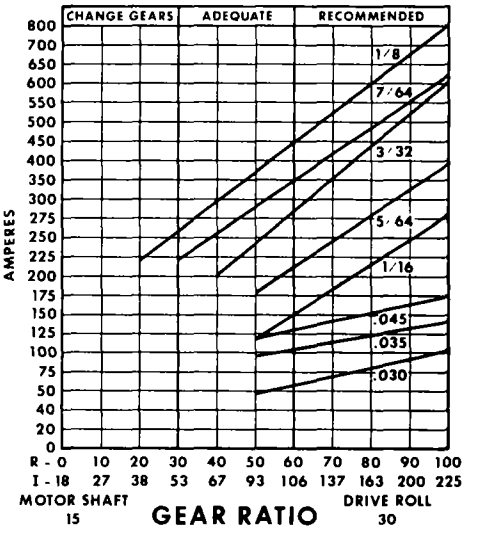
Graph B



Graph C



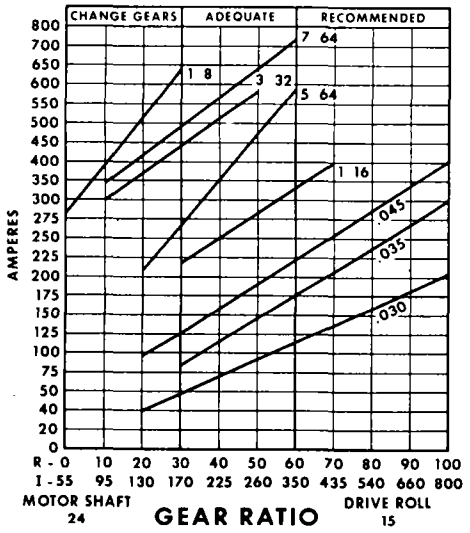
Graph D



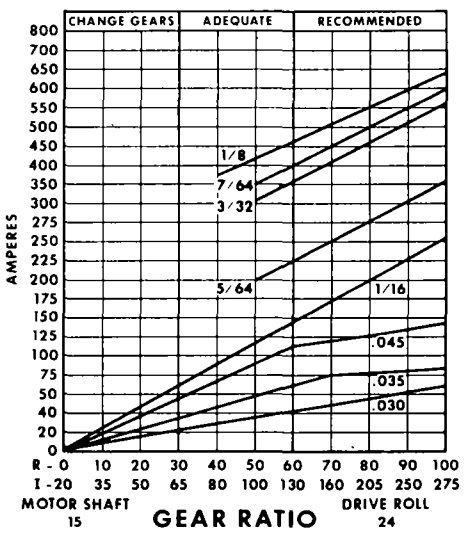
Continued On Following Page

Table 7-6. Amperage Output For Various Speed Change Gear Combinations Figures Based On Use Of CO_2 Shielding Gas (Cont'd.)

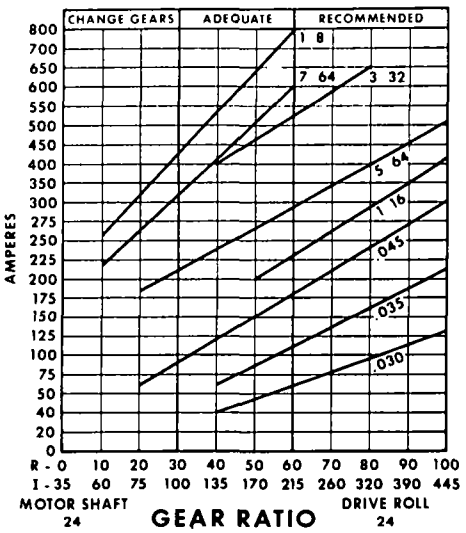
Graph E



Graph F



Graph G



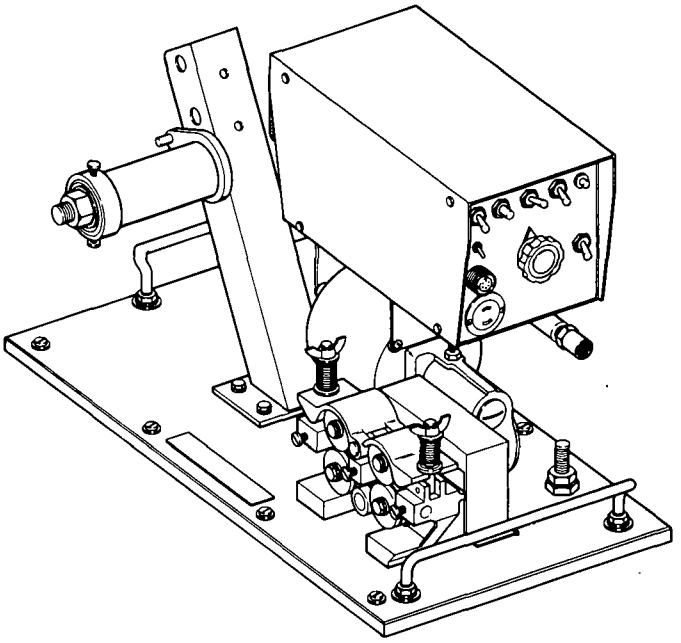
R=Wire Speed Control Settings I= Inches Per Minute

January 1979 FORM: OM-1234A

Effective With Serial No. HJ171707

MODEL

MILLERMATIC 30AN
CONTROL/FEEDER



PARTS LIST

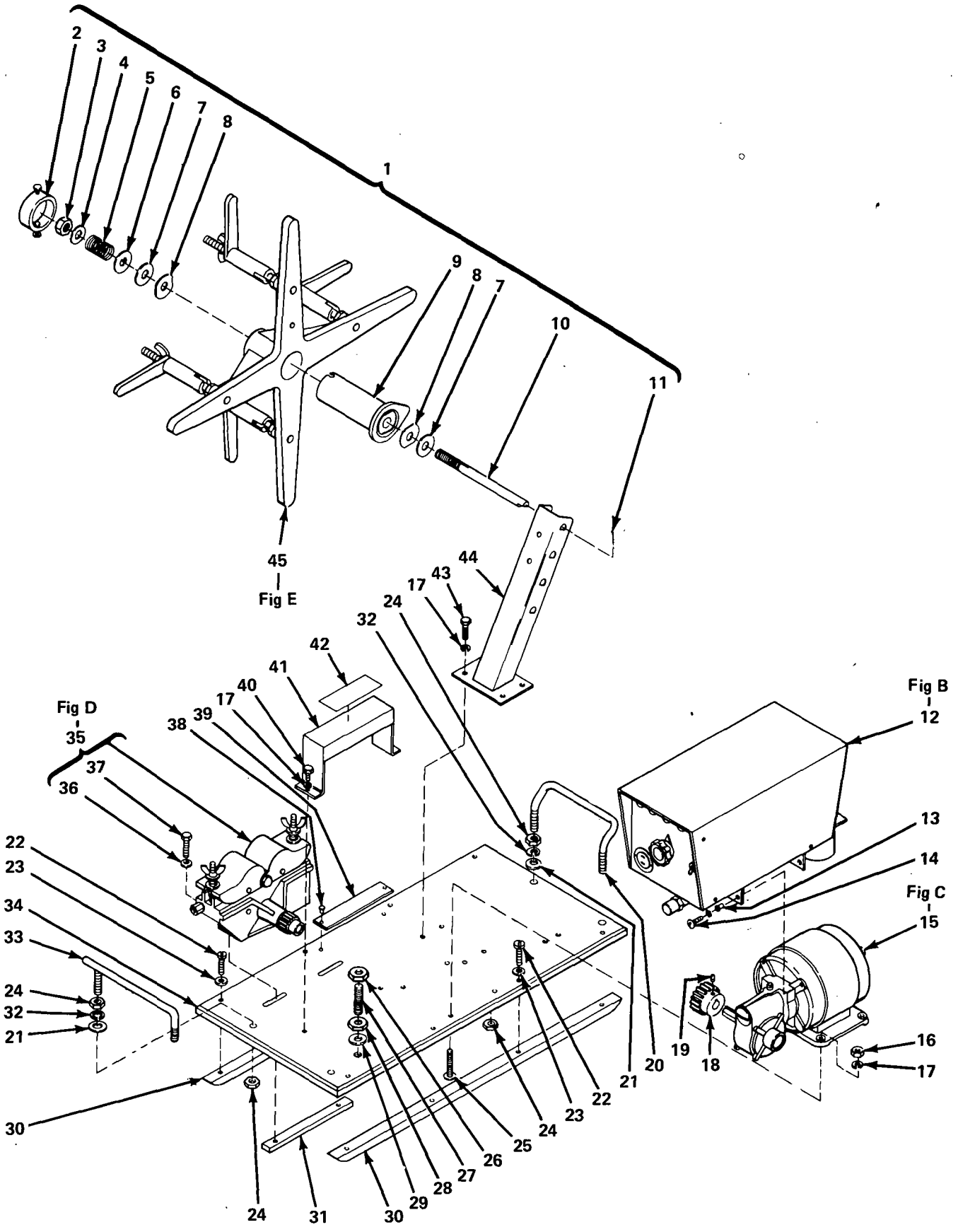


Figure A – Main Assembly

Item No.	Factory Part No.	Description	Quantity
Figure A		**Main Assembly**	
1	058 432	HUB & SPINDLE ASSEMBLY (consisting of)	1
2	058 427	. RING, retaining - spool	1
3	601 884	. NUT, steel - hex jam 5/8-11	1
4	605 941	. WASHER, flat - steel 41/64 ID x 1 OD	1
5	010 233	. SPRING, compression	1
6	057 971	. WASHER, flat - steel keyed 1-1/2 dia	1
7	010 191	. WASHER, fiber 5/8 ID x 1-1/2 OD x 1/8	2
8	058 628	. WASHER, steel - brake	2
9	058 428	. HUB, spool - plastic	1
10	058 434	. SPINDLE, support - hub	1
11	605 946	. PIN, cotter 1/8 x 1	1
12	057 334	CONTROL BOX ASSEMBLY (See Fig. B Page 4)	1
13	034 098	EYELET, brass	4
14	004 880	SCREW, machine - steel hex hd 10-32 x 1-1/2	4
15	004 881	MOTOR, gear (See Fig. C Page 8)	1
16	601 865	NUT, steel - hex full 1/4-20	4
17	602 207	WASHER, lock - split 1/4	10
18	058 877	GEAR, spur - nylon 30 tooth	1
18	058 878	GEAR, fiber 24 tooth	1
18	056 094	GEAR, steel 15 tooth	1
19	604 799	SCREW, set 1/4-20 x 3/4	1
20	057 319	HANDLE, carrying	1
21	010 910	WASHER, flat - steel SAE 3/8	4
22	601 956	SCREW, cap - steel hex hd 1/4-20 x 1-1/4	8
23	602 241	WASHER, flat - steel SAE 1/4	8
24	601 871	NUT, hex - steel 3/8-16 jam	8
25	602 128	SCREW, machine steel flat - hd 1/4-20 x 1-1/2	4
26	601 839	NUT, brass - hex full 1/2-13	1
27	038 825	STUD, brass 1/2-13 x 2	1
28	601 840	NUT, brass - hex jam 1/2-13	1
29	602 247	WASHER, flat - steel SAE 1/2	1
30	056 330	SKID, base	2
31	056 327	BAR, anchor	1
32	602 213	WASHER, lock - steel split 3/8	4
33	028 945	HANDLE, carrying	1
34	028 939	BASE	1
35	058 546	DRIVE ASSEMBLY, wire (See Fig. D Page 10) (consisting of)	1
36	604 538	. WASHER, flat - steel SAE 1/2	2
37	601 959	. SCREW, cap - steel hex hd 5/16-18 x 1-1/2	2
38	602 024	SCREW, drive U type No. 2 x 3/16	2
39		NAMEPLATE (order by stock, model & serial numbers)	1
40	601 926	SCREW, cap - steel hex hd 1/4-20 x 5/8	2
41	056 331	GUARD, drive roll	1
42	012 236	LABEL, important do not use 2 steel gears	1
43	604 631	SCREW, cap - steel hex hd 1/4-20 x 1	4
44	058 429	SUPPORT, spindle	1
45	056 416	REEL, wire (See Fig. E Page 11)	1

BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

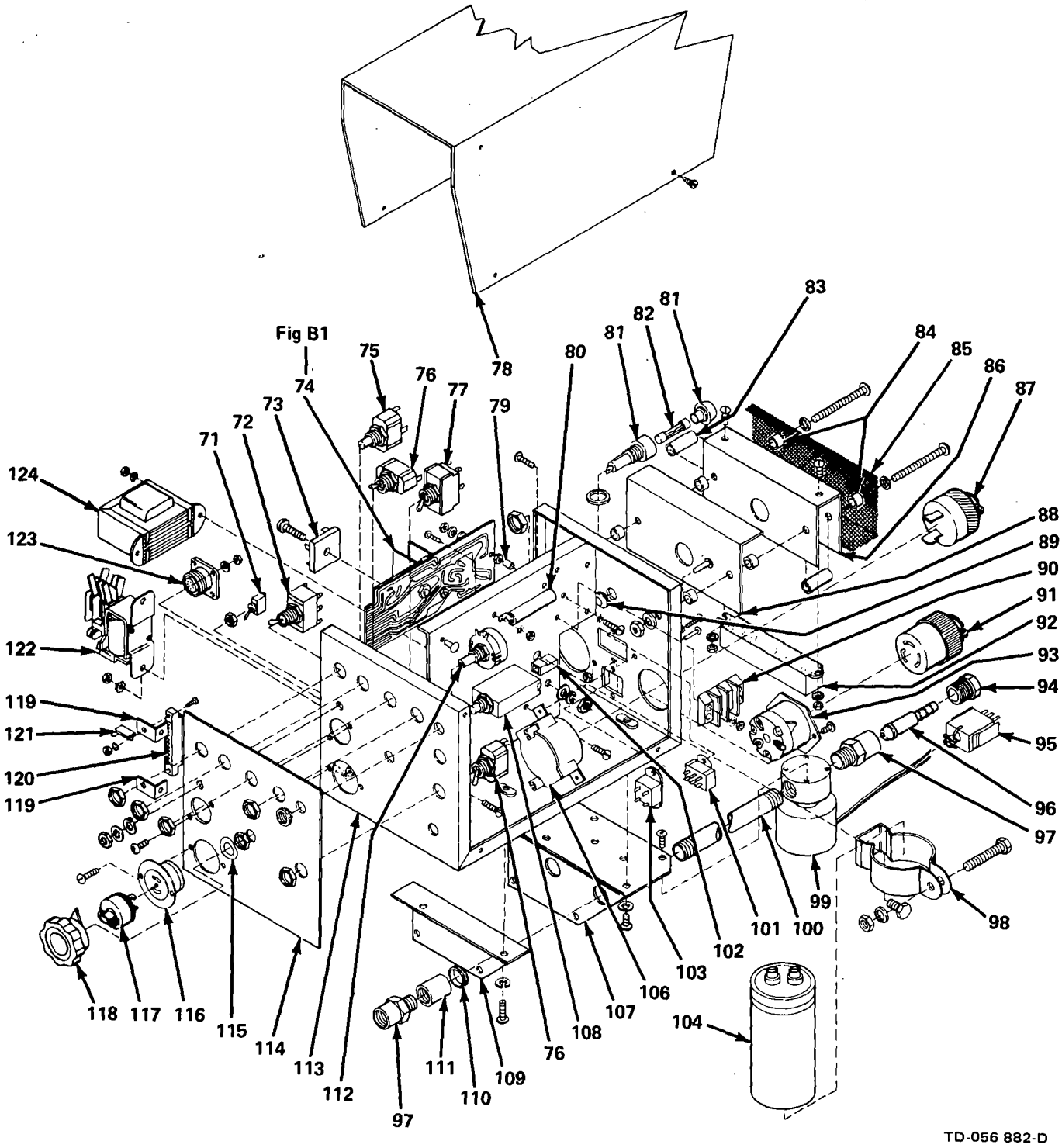


Figure B – Control Box Assembly

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure B		**057 334**	**Control Box Assembly (See Fig. A Page 2 Item 16)**	
71	S6	*011 770	SWITCH, toggle SPDT 5 amp 125 volts	1
72	S4	011 043	SWITCH, toggle DPDT 6 amp 125 volts	1
73	SR1	*035 914	RECTIFIER, integrated 30 amp 400 volts	1
74		057 314	CIRCUIT CARD ASSEMBLY (See Fig. B1 Page 5)	1
75	S5	011 232	SWITCH, push button SPDT	1
76	S1,3	011 233	SWITCH, toggle SPDT 10 amp 250 volts	2
77	S2	011 059	SWITCH, toggle DPDT 15 amp 125 volts	1
78		056 328	WRAPPER	1
79		010 301	BUSHING, brass 9/64 ID x 1/4 OD x 5/16	1
80		012 617	HOLDER, fuse - miniature	1
81	R1	*030 942	RESISTOR, WW fixed 12 watt 10 ohm	1
82	F1	*012 655	FUSE, miniature - glass 10 amp	1
83		010 199	TUBING, steel .275 ID x .048 wall x 1	2
84		010 193	TUBING, steel 3/8 OD x 18 ga x 1/4	6
85		056 170	SHIELD	1
86		030 949	HEAT SINK	1
87		+039 618	CAP, twistlock 2P2W	1
88		056 169	BRACKET, mounting - heat sink	1
89		057 084	BUSHING, snap 1/4 ID x 3/8 mounting hole	1
90	1T	038 855	BLOCK, terminal 20 amp 2 pole	1
91		+056 442	BODY, connector - grounded twistlock 2P2W	1
92	R2	*030 941	RESISTOR, WW fixed 100 watt 5 ohm	1
93	RC7	056 665	RECEPTACLE, male - flanged grounded twistlock 2P3W	1
94		010 606	FITTING, hose - brass nut 5/18-18	1
95		056 265	CONNECTOR, male 6 contact 10 amp	1
96		010 603	FITTING, hose - brass barbed nipple 1/4 TBG	1
97		010 604	FITTING, hose - brass bushing 1/4 NPT x 5/8	2
98		010 927	HANGER, *minerallic* No. 4	1
99	GS1	035 601	VALVE, 115 volts ac 2 way 1/4 IPS port 1/8 orifice (consisting of)	1
		033 050	. COIL	1
100		010 190	FITTING, pipe - galvanized nipple L 1/4 NPT x 10	1
101	RC4	056 266	CONNECTOR, female 6 contact	1
102		026 837	INSULATOR, terminal - nylon	2
103	RC1	054 116	CONNECTOR, female 4 contact	1
104	C1	*031 692	CAPACITOR, electrolytic 750 uf 200 volts dc	1
106	RC3	039 855	RECEPTACLE, twistlock 2P2W	1
107		056 165	BRACKET, mounting - rear	1
108	CB1	*011 991	CIRCUIT BREAKER, 1.5 amp 250 volts	1
109		056 166	BRACKET, mounting - front	1
110		010 378	GROMMET, rubber 9/16 ID x 3/4 hole 1/16 groove	1
111		602 934	FITTING, pipe - galvanized coupling 1/4 NPT	1
112	R5	*030 943	POTENTIOMETER, carbon - single turn 2 watt 15K ohm	1
113		053 881	CHASSIS	1
114			NAMEPLATE (order by stock, model & style numbers)	1
115		010 929	WASHER, flat - steel spring 3/8	1
116	RC2	039 759	RECEPTACLE, female - flanged midget twistlock 2P2W	1
117		604 523	CAP, twistlock - midget 2P2W	1
118		019 609	KNOB, pointer	1
119		031 251	BRACKET, mounting - connector	2
120	RC5	039 756	CONNECTOR, amphenol	1
121		038 784	STRIP, terminal 1 pole	1
122	CR1	*034 841	RELAY, 24 volts ac DPDT	1
123	RC6	039 825	RECEPTACLE, 6 socket MS-3102A-14S-6S	1
124	T1	*036 135	TRANSFORMER, SNC 115/24 volts ac	1

*Recommended Spare Parts.
+These items are not included when ordering Control Box Assembly.
BE SURE TO PROVIDE STOCK, MODEL, AND STYLE NUMBERS WHEN ORDERING REPLACEMENT PARTS.

Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure B1	**057 314**	**Circuit Card Assembly (See Fig. B Page 4 Item 74)**	
C2,3	031 694	CAPACITOR, mylar 0.47 uf 200 volts dc	2
C4,8,9	031 643	CAPACITOR, ceramic 0.01 uf 500 volts dc	3
C7	031 693	CAPACITOR, mylar 0.33 uf 75 volts dc	1
C10	031 633	CAPACITOR, electrolylic 80 uf 25 volts dc	1
C12	031 721	CAPACITOR, mylar 0.22 uf 200 volts dc	1
D1-4	026 202	DIODE, 1 amp 400 volts straight polarity	4
D5	037 250	DIODE, zener 24 volts 1 watt	1
Q1	037 824	THYRISTOR, 7.4 amp 200 volts	1
	010 915	WASHER, flat - brass 1/4 (mounting Q1)	1
	602 208	WASHER, lock - steel external tooth 1/4 (mounting Q1)	1
	601 867	NUT, steel - hex jam 1/4-20 (mounting Q1)	1
	037 261	HEAT SINK	1
Q2	037 289	TRANSISTOR, unijunction 50MA 35 volts	1
R3	030 937	RESISTOR, carbon 0.5 watt 10 ohm	1
R4	030 854	RESISTOR, carbon 0.5 watt 18K ohm	1
R6	030 945	RESISTOR, carbon 2 watt 4700 ohm	1
R7	028 276	RESISTOR, carbon 0.5 watt 2200 ohm	1
R8	030 944	POTENTIOMETER, WW 1 turn 2 watt 5000 ohm	1
R9	030 936	RESISTOR, carbon 0.5 watt 33K ohm	1
R10	030 853	RESISTOR, carbon 0.5 watt 2200 ohm	1
R11	030 938	RESISTOR, carbon 0.5 watt 1200 ohm	1
R12	030 934	RESISTOR, carbon 0.5 watt 6800 ohm	1
R20	030 090	RESISTOR, carbon 0.5 watt 47 ohm	1
T2	036 143	TRANSFORMER, pulse	1
	602 196	WASHER, lock - steel internal tooth No. 4 (mounting T2)	1
	601 858	NUT, steel - hex 4-40 (mounting T2)	1

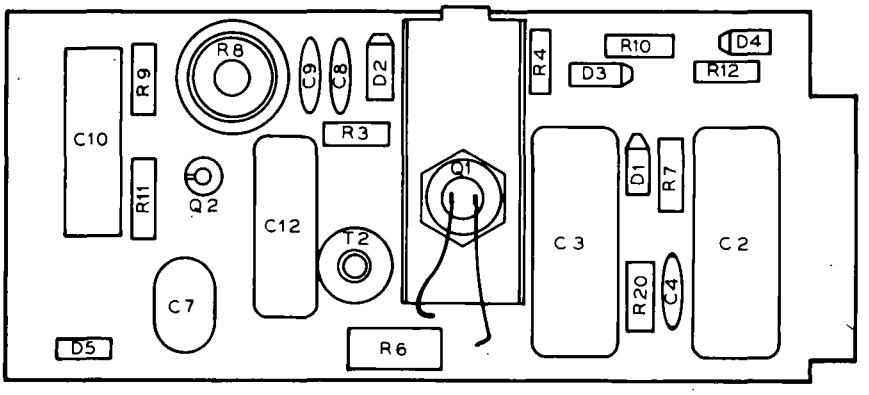


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Figure B1 — Circuit Card Assembly

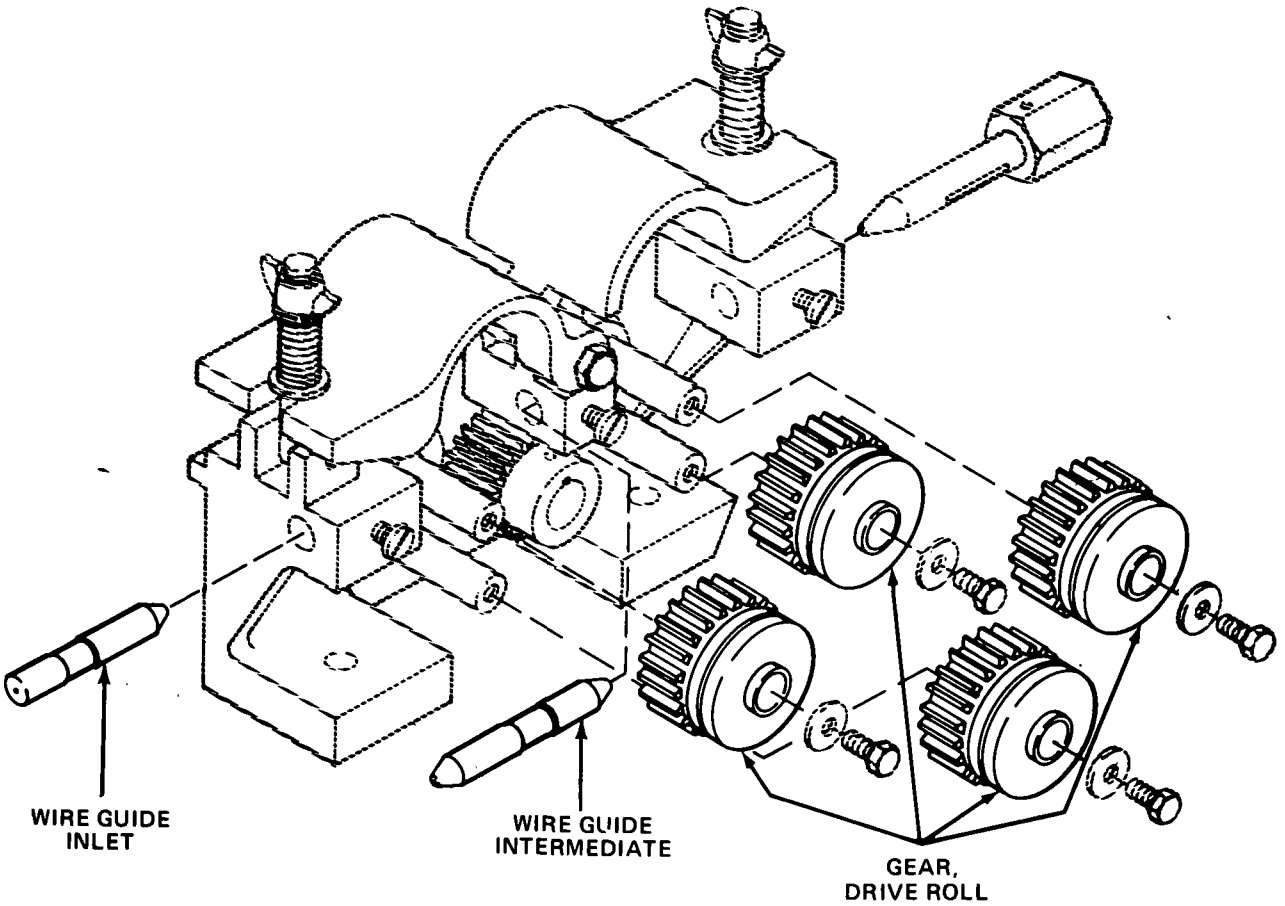
COMPONENTS TO BE REPLACED BY QUALIFIED PERSONNEL ONLY

BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

WIRE DRIVE ROLL GEARS AND WIRE GUIDES FOR VARIOUS WIRE SIZES

Control/ Feeder	Wire Diameter and Type			Kit No.	Gear Drive Roll		Guide Part Numbers	
	Fraction	Decimal	Metric		Part No.	Type	Inlet	Intermediate
058 484	.030" hard	.030	.8MM	058 500	058 516	V-Groove	056 192	056 206
058 485	.035" hard	.035	.9MM	058 501	058 517	V-Groove	056 192	056 206
058 486	.045" hard	.045	1.2MM	058 502	058 518	V-Groove	056 193	056 207
058 487	.052" hard	.052	1.3MM	058 503	058 482	V-Groove	056 193	056 207
058 488	1/16" hard	.062	1.6MM	058 504	058 519	V-Groove	056 195	056 209
058 489	.045" hard & cored	.045	1.2MM	058 505	058 520	U-Groove	056 193	056 207
058 490	1/16" hard & cored	.062	1.6MM	058 506	058 521	U-Groove	056 195	056 209
058 491	5/64" hard & cored	.078	2.0MM	058 507	058 522	U-Groove	056 195	056 209
058 492	3/32" hard & cored	.093	2.4MM	058 508	058 523	U-Groove	056 196	056 210
058 493	7/64" hard & cored	.109	2.8MM	058 509	058 524	U-Groove	056 196	056 210
058 494	1/8" hard & cored	.125	3.2MM	058 510	058 525	U-Groove	056 197	056 211
058 495	1/16" cored	.062	1.6MM	058 780	058 775	V-Knurled	056 195	056 209
058 496	5/64" cored	.078	2.0MM	058 781	058 776	V-Knurled	056 195	056 209
058 497	3/32" cored	.093	2.4MM	058 782	058 777	V-Knurled	056 196	056 210
058 498	7/64" cored	.109	2.8MM	058 783	058 778	V-Knurled	056 196	056 210
058 499	1/8" cored	.125	3.2MM	058 784	058 779	V-Knurled	056 197	056 211

Outlet guide is furnished with torch assembly.



TC-056 276-A

Wire Drive Roll Gear And Guide Assembly

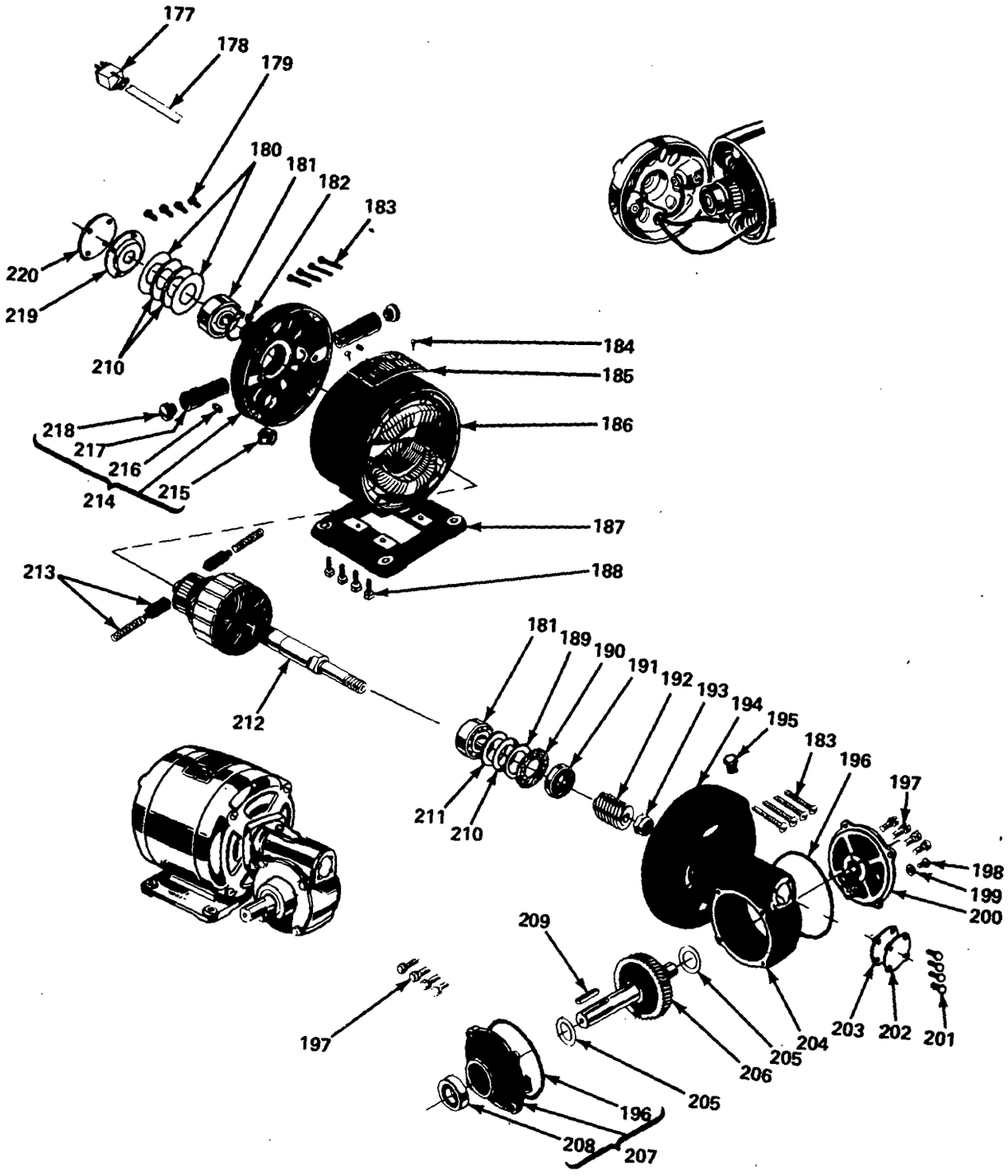
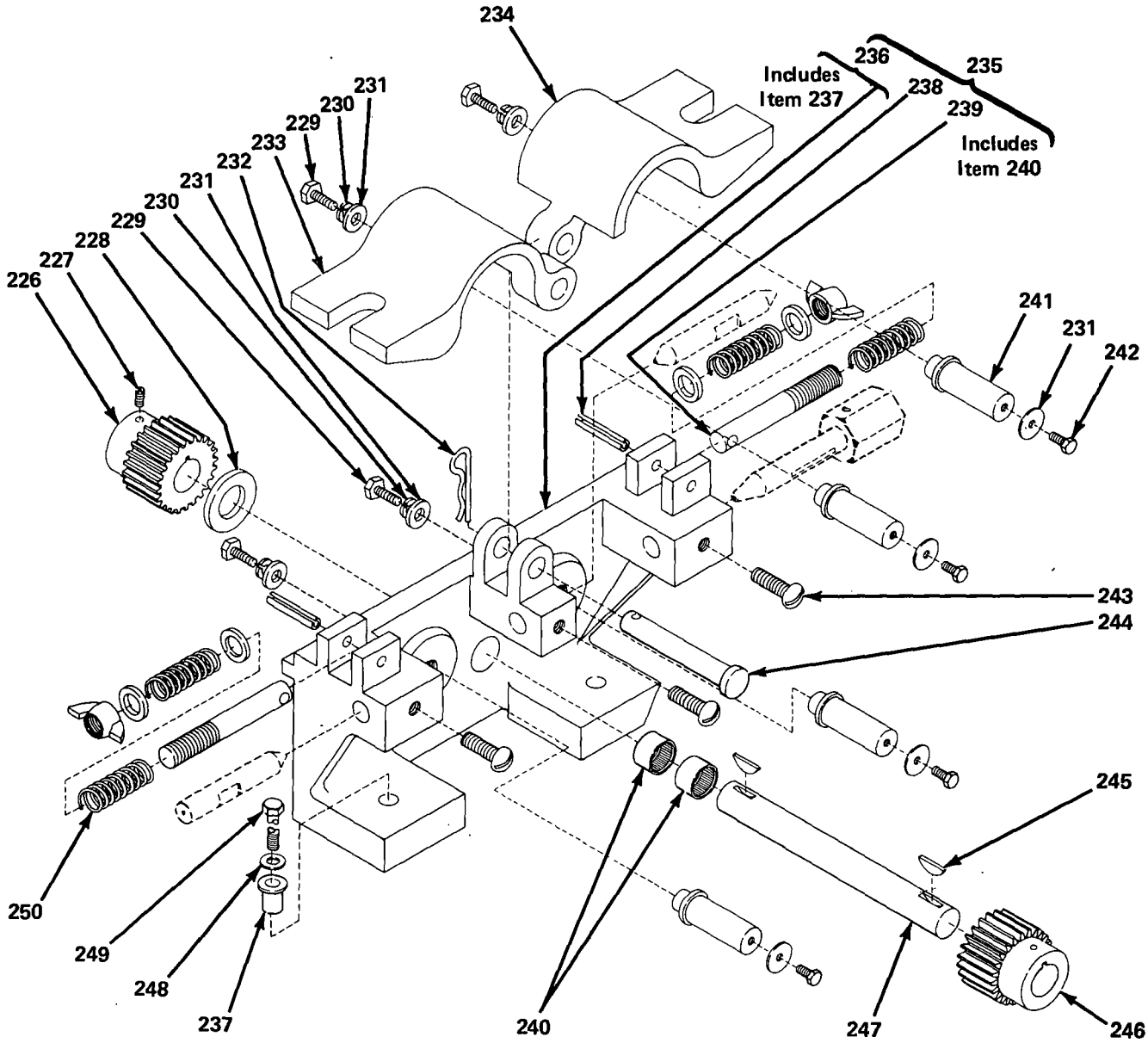


Figure C – Motor, Gear

Item No.	Factory Part No.	Description	Quantity
Figure C	**004 881**	**Motor, Gear (See Fig. A Page 2 Item 19)**	
177	056 264	CONNECTOR, male 4 contact	1
178	604 571	CORD, portable No. 18/4 conductor (order by foot)	2 ft.
179	602 080	SCREW, ball - bearing plate	4
180	054 396	WASHER, spacer	As Req'd
181	052 182	BEARING, ball	2
182	009 411	RING, retaining - external	2
183	602 099	SCREW, shield	8
184	056 373	PIN, nameplate	2
185	054 404	NAMEPLATE	1
186	054 406	FIELD ASSEMBLY	1
187	054 407	BASE	1
188	054 408	SCREW, base	4
189	054 413	WASHER, spacing	As Req'd
190	054 414	GASKET, grease	1
191	054 415	SEAL, oil	1
192	054 417	GEAR, worm	1
193	054 418	NUT, lock - worm	1
194	009 407	BACK SHIELD	1
195	054 433	PLUG, oil fill & air vent	1
196	009 416	SEAL, O ring	2
197	009 409	SCREW, gear housing end shield	8
198	054 432	SCREW, oil level	1
199	054 431	GASKET, oil screw	1
200	009 405	END SHIELD ASSEMBLY, gear housing	1
201	009 414	SCREWS, end cap	4
202	009 413	END CAP, gear housing	1
203	009 412	GASKET, end cap	1
204	009 408	HOUSING, gear	1
205	009 417	WASHER, spacer	2
206	056 377	GEAR & SHAFT, drive	1
207	009 404	END SHIELD ASSEMBLY (consisting of)	1
208	054 222	. SEAL	1
209	054 426	KEY	1
210	054 434	WASHER, spring	3
211	009 410	WASHER, spring	2
212	054 411	ARMATURE	1
213	*056 378	BRUSH & SPRING	2
214	054 399	FRONT SHIELD ASSEMBLY (enclosed) (consisting of)	1
215	054 402	. BUSHING, terminal	1
216	054 401	. SCREW, set	2
217	054 400	. HOLDER, brush	2
218	054 398	. SCREW, brush holder cap	2
219	054 394	WASHER, felt retainer	1
220	054 393	PLATE, ball bearing (closed)	1

*Recommended Spare Parts.

BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.



TD-058 546

Figure D – Drive Assembly, Wire

Item No.	Factory Part No.	Description	Quantity
Figure D	**058 546**	**Drive Assembly, Wire (See Fig. A Page 2 Item 39)**	
226	058 478	GEAR, spur - steel 24 tooth	1
227	602 179	SCREW, set 1/4-20 x 1/2	2
228	010 658	BEARING, thrust 5/8 ID x 1/4 OD x 1/8	1
229	601 927	SCREW, cap - steel hex head 1/4-20 x 3/4	4
230	602 207	WASHER, lock - steel split 1/4	4
231	602 241	WASHER, flat - steel SAE 1/4	8
232	010 313	PIN, cotter - hair	1
233	056 152	COVER, rear	1
234	056 151	COVER, front	1
235	058 483	HOUSING, drive (consisting of)	1
236	058 168	. HOUSING, drive with bushing (consisting of)	1
237	058 112	. . BUSHING, flanged - nylon 5/16 ID x 7/16 OD x 3/4	2
238	010 224	. PIN, spring 3/16 x 1	2
239	056 306	. FASTENER, pinned	2
240	605 996	. BEARING, needle	2
241	058 481	SHAFT, drive roll	4
242	601 925	SCREW, cap - steel hex head 1/4-20 x 1/2	4
243	604 624	SCREW, machine - steel fillister head 1/4-20 x 1/2	3
244	010 312	PIN, machine - steel 3/8 x 2-1/4	1
245	605 997	KEY, Woodruff 3/16 x 3/4	2
246	058 876	GEAR, spur - fiber 15 tooth	1
	605 789	SCREW, set - steel socket hd 10-24 x 1/4	1
247	058 480	SHAFT, drive gear	1
248	604 538	WASHER, flat - steel SAE 5/16	2
249	601 959	SCREW, cap - steel hex head 5/16-18 x 1-1/2	2
250	010 232	SPRING, compression - bottom	2
251	604 590	NUT, steel - wing 3/8-16	2
252	010 910	WASHER, flat - steel SAE 3/8	2
253	010 231	SPRING, compression - top	2
254	602 243	WASHER, flat - steel standard 3/8	2

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Item No.	Factory Part No.	Description	Quantity
Figure E	**056 416**	**Reel Wire (See Fig. A Page 2 Item 49)**	
261	010 910	WASHER, flat 3/8 SAE	2
262	601 964	SCREW, cap - hex head 3/8-16 x 3/4	1
263	604 051	NUT, wing 1/2-13	4
264	056 312	FINGER, reel	4
265	056 313	STUD, steel 1/2-13 x 7 inches	4
266	010 224	PIN, spring 3/16 x 1 inch	4
267	601 880	NUT, hex - steel jam 1/2-13	4
268	056 314	REEL	1

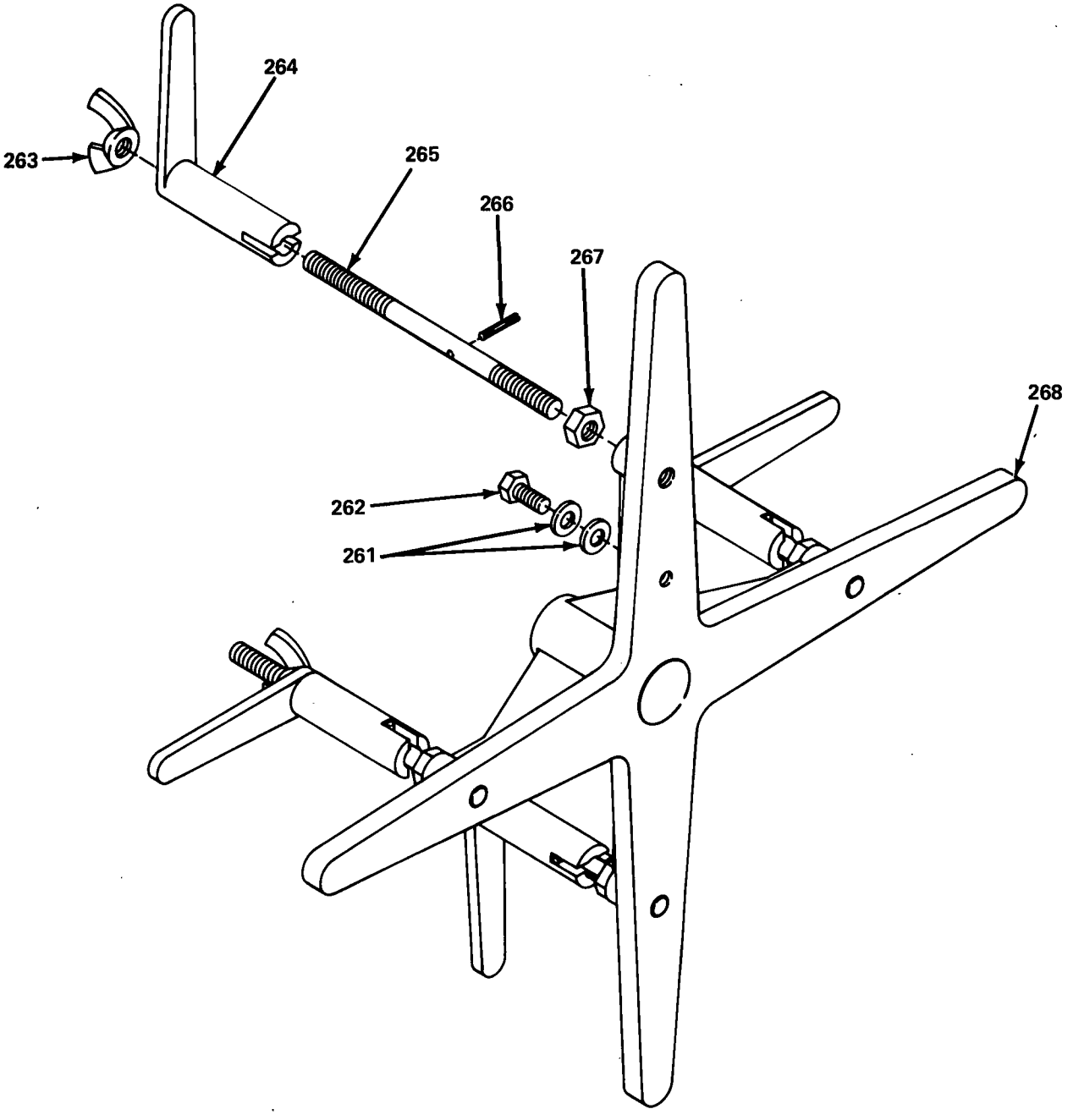

Figure E — Reel, Wire

BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.